

IT'S TIME FOR A NATIONAL ENERGY SECURITY STRATEGY

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USAWC STRATEGY RESEARCH PROJECT

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by

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ABSTRACT

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The United States has been unchallenged as the sole economic and military superpower in the world over the last 15 years. However, a near decade long volatility in energy markets has led some Americans to question whether the U.S. can preserve that standing in the world. Colonel Greg Wright argues that what is needed to retain our military and economic superpower advantage is a new, overarching, United States National Energy Security Strategy. This new National Energy Security Strategy should set the strict goal of making the United States energy independent by 2020; its essential components should include diversifying and increasing energy supplies, increasing conservation, decreasing greenhouse gas emissions and modernizing energy distribution and production systems.

IT'S TIME FOR A NATIONAL ENERGY SECURITY STRATEGY

Over the last six months, crude oil prices have approached and surpassed \$100 per barrel. The average price of gasoline nationwide has remained above \$3 per gallon. These increases in crude oil and gasoline prices were not recent spikes but rather the culmination of a serious upward trend in prices for this vital commodity over the last eight years. Increasing demand for oil by India and China in conjunction with rising domestic consumption has squeezed the supply of oil on the world markets.

American demand for energy has increased over the last twenty years. The United States now consumes nearly 22 million barrels per day (mbd) of petroleum compared to 18 mbd during the Iranian Hostage Crisis of 1979.¹ In the interim, domestic oil production has declined and the United States now imports 65% of its oil from foreign suppliers.² American electrical energy consumption continues to increase even though American industry is more energy efficient than ever.

The United States standing as the sole economic and military superpower in the world has been unchallenged over the last 15 years. However, our information and firepower overmatch against any potential near peer competitor means little without having the strategic mobility to deploy our forces to any region of the world. The fuel of choice for strategic mobility for US forces is oil or oil based fuels. Our capability to globally engage our friends and potential adversaries hinges on our ability to have access to this most vital commodity. Oil also powers the engine of our economic supremacy. Currently, the United States' Gross Domestic Product (GDP) is greater than the combined GDPs of Japan, China, India and Germany.

In his most recent State of the Union address, President Bush spent a few minutes discussing energy security. In his speech he said:

To build a future of energy security, we must trust in the creative genius of American researchers and entrepreneurs and empower them to pioneer a new generation of clean energy technology. Our security, our prosperity, and our environment all require reducing our dependence on oil. Last year, I asked you to pass legislation to reduce oil consumption over the next decade, and you responded. Together we should take the next steps: Let us fund new technologies that can generate coal power while capturing carbon emissions. Let us increase the use of renewable power and emissions-free nuclear power. Let us continue investing in advanced battery technology and renewable fuels to power the cars and trucks of the future. Let us create a new international clean technology fund, which will help developing nations like India and China make greater use of clean energy sources. And let us complete an international agreement that has the potential to slow, stop, and eventually reverse the growth of greenhouse gases.

This agreement will be effective only if it includes commitments by every major economy and gives none a free ride. The United States is committed to strengthening our energy security and confronting global climate change. And the best way to meet these goals is for America to continue leading the way toward the development of cleaner and more energy-efficient technology.³

In order to retain our military and economic superpower advantage and for the President's vision to be achieved, the United States needs an overarching National Energy Security Strategy to guide us over the next decade. The new National Energy Security Strategy should set the strict goal of making the United States energy independent by 2020 and its essential components should include diversifying and increasing energy supplies, increasing conservation, decreasing greenhouse gas emissions and modernizing energy distribution and production systems.

It's Time for an NSC 68 for Energy Security

National Security Council (NSC) 68 was the document that guided our country's national security during the 1950's. Widely acknowledged as one of the most influential

documents of US national security, NSC 68 described the major threat (the growing capabilities of the Soviet Union) to the national survival of the United States and outlined various courses of action to combat that threat. NSC 68 is widely credited with focusing American political, economic, and military efforts to confront the Soviet Union and was “hailed by some as the master plan that had brought victory in the Cold War.”⁴ NSC 68 accurately and dispassionately outlined the primary threat to our national security and argued for the course of action known as “A Rapid Build-Up of Political, Economic, and Military Strength in the Free World.”⁵ The energy challenges faced by the US today demand an equally rigorous examination and creation of a similar guiding document.

Many books and articles have been written about energy security without adequately defining energy security. Energy security in its most basic form is the ability of a nation to have sufficient energy (both electrical production and transportation fuels) to meet its economic and military needs for the short and the foreseeable future. In other words, economic and military well-being cannot be held hostage by insufficient access to energy resources. By this definition, the United States may be energy insecure.

Although the United States may not be in an energy crisis yet, most experts agree that global petroleum demand will outstrip supply in the next fifteen years. World oil demand currently equals world supply at approximately 84 mbd.⁶ Historically, when demand has equaled or been greater than supply, then OPEC and other oil producing countries have usually gradually increased production to meet the need. However, burgeoning economic growth by China and India as well as the American public's

apparently insatiable appetite for big and powerful cars suggests that at best rising demand will continue to squeeze the new supplies of oil. At worst, rising demand in the next decade will drastically outstrip supply and cause additional price shocks for US consumers that could dwarf those seen after Hurricanes Katrina and Rita in 2005.

The amount of oil in the ground is finite. While many experts debate on when the world will reach peak oil output, there is no argument that it will happen sometime in the future. Nader Elhefnawy, an author on international and space security, stated that “annual worldwide oil consumption is roughly 29 billion barrels a year and is expected to increase at 2% a year based on current economic forecasts.”⁷ Meanwhile, current proven reserves of oil equal approximately 1.2 trillion barrels of oil.⁸ A straight line linear projection of growth and demand versus proven gross supply would suggest oil will run out in approximately 2030.⁹ However, actual oil reserves are probably larger than what has been published since currently non-producing “mature” oil fields can be brought back into production when oil prices are high. For example, some Texas oil fields that have been out of production for a decade are now producing oil again because at today's prices it is once again economically feasible. Nevertheless, oil supply will eventually run out. We have to determine whether we will be proactively prepared for that certainty or will we react to that emergency or crisis only when it occurs. If the US waits and reacts, then we could very well encounter some worst case scenarios for the future, where we enter into a “Survival of the Fittest” contest of nation states over oil and resource allocation or something modeled on a “Mad Max” paradigm of the modern era ending with a fizzle.¹⁰

Since the early 1980's, US energy policy has relied primarily on free market principles. One of the major drawbacks to this policy is that oil price shocks "are seldom anticipated, market prices can and do rise dramatically" in the event of drastic supply interruptions."¹¹ These oil price shocks have a dramatic and measurable effect on the US economy. The Federal Reserve Chairman in April 2006 wrote to Representative Barrett that the increases in energy prices over the previous three years reduced real GDP growth by 1% per year.¹² In other words, American GDP would have been \$345B higher by April 2006 if energy prices had not increased during this time period.¹³

Existing National Security documents do not adequately address the implications of American energy insecurity. In Part VI of the National Security Strategy of the United States, one of the major challenges limiting the United States' ability to "Ignite a New Era of Global Economic Growth" was that "many countries are too dependent upon foreign oil, which is often imported from unstable parts of the world."¹⁴ The National Security Strategy path forward outlined a broad policy in that the US should open, integrate and diversify energy markets to ensure energy independence. The main "key to ensuring our energy security is diversity in the regions from which energy resources come and in the types of energy resources on which we rely."¹⁵ This diversification will help obviate "the "petroleum curse" – the tendency for oil revenues to foster corruption and prevent economic growth and political reform in some oil producing states."¹⁶ Unfortunately, American dependence on foreign oil has increased nearly 50% over the last eight years.

Unlike the National Security Strategy, the National Defense Strategy of the United States makes no direct references to energy security. However, there are some

inferences in this document that relate to a discussion on energy security. These inferences are drawn from the National Security Strategy being “designed around securing strategic access to key regions, lines of communication and the global commons.”¹⁷ Some of the desired capabilities outlined in the National Defense Strategy are directly impacted by our ability to project power anywhere in the world. Strategic mobility and access to the resources that fuel this mobility is one of the implicit underlying assumptions guiding this document.

Similar to the National Defense Strategy, the National Military Strategy of the United States does not directly reference energy security. However, two of the major objectives of the National Military Strategy, “Protect the United States” and “Prevent Conflict and Surprise Attacks”, incorporate maintaining strategic access and retaining freedom of action.¹⁸ One of the primary reasons the U.S. must maintain strategic access is to ensure the free flow of foreign oil to the United States. This access to Persian Gulf oil to sustain our economy has been and remains one of the underlying tenets of American Grand Strategy since the end of World War II, with the associated military costs paid almost exclusively by the United States (estimated in 2003 at \$50B annually).¹⁹ As long as we are so dependent on foreign oil imports, the United States must remain militarily engaged in the Persian Gulf region for the foreseeable future.

Finally, the National Energy Policy of 2001 and its subsequent revisions in 2005 and 2007 have not sufficiently addressed the problem of American energy insecurity. Although the National Energy Policy adequately defined energy security issues, neither the National Energy Policy nor the legislation to fund its pilot programs and technology investments have kept pace with rising world wide demand for oil. However, since the

National Energy Policy's publication in 2001 the price of oil has *more* than tripled.²⁰ Oil imports account for 1/3 of our trade deficit with foreign countries and totaled \$250B in 2005.²¹ American consumption increased from 19.5 M bpd to 22.5 M bpd from 2000 to 2007. This increase in consumption has been met exclusively by increased foreign imports. By most metrics, the current National Energy Policy does not sufficiently address the magnitude of our current energy insecurity.

Since our current national energy policy is not meeting its objectives, a National Energy Security Strategy is needed that would fulfill United States' energy security objectives. What is required is a published National Energy Security Strategy that would elevate the energy security issue to the level of the National Military and Defense Strategies. Such a raising of the bar should garner a commensurate level of resources through the Federal budget process. Additionally, a National Energy Security Strategy could help completely focus the efforts of the nation to an objective to become energy self-sufficient within a specified time period. An all encompassing strategy could also signal to industry that the United States government intended to stay the course on the pursuit and fielding of alternative energy solutions in our path to energy independence. There are two additional advantages in publishing a National Energy Security Strategy. One, this published strategy would clearly articulate the national security implications of energy dependency and lay out the most viable courses of action for the nation. Two, the dialogue and coordination necessary to gain agreement to produce a published strategy should help galvanize and solidify our national objectives. A National Energy Security Strategy could allow the country to proactively prepare for the time when fossil fuels start to become scarce.

The main disadvantages of promulgating a National Energy Security Strategy are that some would say we are abandoning free market principles by having the federal government intervene in the energy market. Others would say we are further adding to the proliferation of National Security documents that has occurred over the last decade. What is clear, however, is that the nation's path forward as outlined in the current National Energy Policy has not kept pace with the current supply constrained energy market.

The United States should be proactive in alleviating its energy insecurity. The consequences of waiting for the onset of a future crisis are too extreme to contemplate.

Key Interrelationships Among Energy Sources, Uses, and Strategy

As previously noted, the federal government since the early 1980's has pursued an almost exclusively market based approach to expanding our supply of energy. Federal investment in new and alternative energy sources declined and most budding alternative energy industries were left to wither on the vine. Only at those times when oil and energy prices rose precipitously was there enough political will to raise federal investment. Thomas Friedman, author of numerous energy related articles, argues

What has happened in energy over the last 35 years is that when the oil price goes up, stimulating government subsidies and some investments in alternatives, and then the price goes down, the government loses interest, the subsidies expire and the investors get wiped out.²²

Our country's current, negligible production of alternative energy is because of the vacillation of governmental policies on pursuing alternative energy sources over the last three decades. As Jeffrey Emmelt, the Chairman of GE said to Friedman,

the big energy players are being asked "to take a 15 minute market signal and make a 40-year decision and that just doesn't work....The U.S. government should decide: What do we want to happen? How much clean

coal, how much nuclear, and what is the most efficient way to incentivize people to get there?²³

Emmelt's quote was directed mostly at electrical power production, but is also applicable to the alternative fuel industry.

Electrical power generation in the United States is heavily reliant on fossil fuels. As outlined in the chart below, fossil fuel sources account for 70% of electricity generation in the United States.

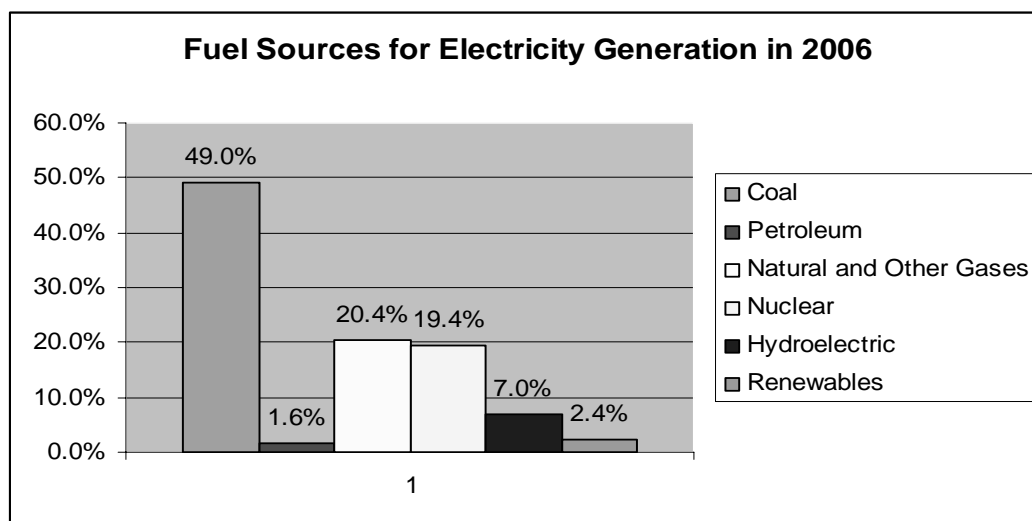


Figure 1: Fuel Sources for Electricity Generation in 2006²⁴

Fortunately, petroleum is not a major player in US electricity production. However, US electricity production remains reliant on other fossil fuels which also are finite resources and emit carbon, sulfur and nitrogen based pollutants. Diversification of our fuel for electrical production from fossil based sources will have a positive impact on the environment.

Since the accident at Three Mile Island in 1979, the US nuclear industry has been locked in place due to the threat of lawsuits, the long term nuclear waste storage issue and the history of nuclear facility cost overruns. The 2005 and 2007 energy bills created

a system of federal loan guarantees that would help underwrite the cost of building a new nuclear power plant. Unfortunately, despite authorizing the program Congress has provided few or no resources actually to fund this initiative. Even so, upwards of 20 new permits for new nuclear power plants are in various stages of review by the US Department of Energy.²⁵ Additionally, US firms are now designing new, smaller and modular nuclear plants that should reduce the initial capital expense of building some of the mammoth facilities constructed in the past. A little real push by the federal government could provide the impetus to jump start a significant degree of new nuclear power plant construction.

Unfortunately, hydroelectric power offers little additional opportunity for diversifying our electrical power generation sources. Although some promising technologies for tidal hydroelectric power generation may be available soon, there are few if any sites suitable for exploitation in the continental United States.

Renewable energy sources such as wind, solar and geothermal offer the most promising short and mid term approaches to diversifying US electrical power generation. Wind turbines now account for 15% of Denmark's electricity and US potential wind power production could be enormous.²⁶ Advances in solar panel efficiencies have now made solar power cost competitive with other sources of power for electricity. Additionally, the US has potentially large sources of untapped geothermal energy in the Western US. Bringing additional renewable sources into the grid would help alleviate our dependency on fossil fuels as well as lowering our CO₂ output. Even though the US is not heavily dependent on foreign fuel sources for electrical power

generation, diversifying our supplies away from finite fossil fuels could make us more energy secure.

The transportation sector is by far the heaviest user of crude oil in the United States. In fact, transportation accounts for nearly 70% of crude oil consumption in the United States (figure 2).

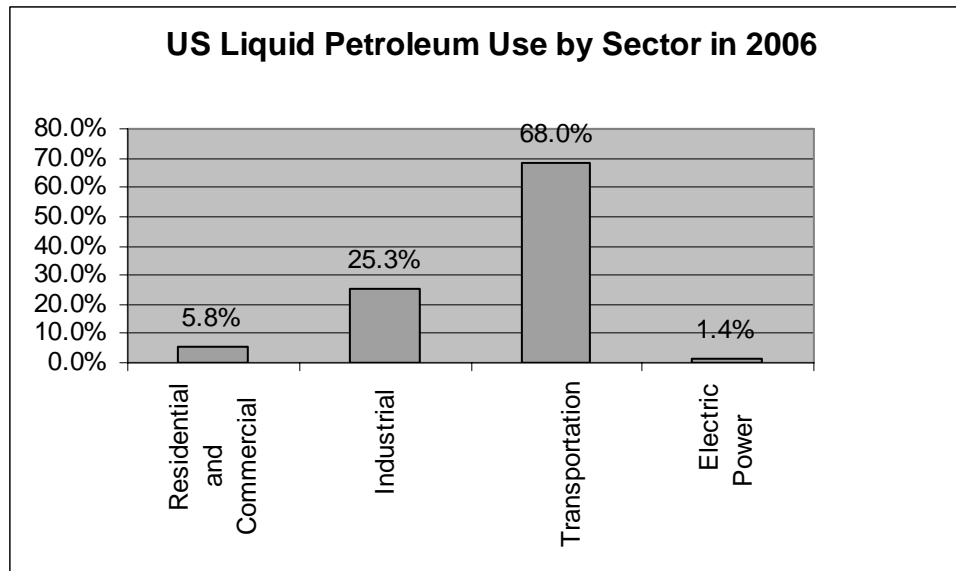


Figure 2. US Petroleum Use By Sector²⁷

Any policy that wishes to address US crude oil consumption must address the transportation sector's huge appetite for crude oil products.

An in depth analysis of the specific consumers in the transportation sector indicates one major category of user. Motor vehicles (asterisks in the table following) account for 80% of consumption in the transportation sector.

	M bpd	%
Light-Duty Vehicles *	8.61	60.3%
Commercial Light Trucks *	0.32	2.2%
Bus Transportation *	0.13	0.9%
Freight Trucks *	2.33	16.3%
Rail, Passenger	0.02	0.1%
Rail, Freight	0.27	1.9%
Shipping, Domestic	0.15	1.0%
Shipping, International	0.34	2.4%
Recreational Boats	0.13	0.9%
Air	1.28	9.0%
Military Use	0.33	2.3%
Lubricants	0.07	0.5%
Pipeline Fuel	0.30	2.1%
Total	14.27	100.0%

Table 1. US Transportation Fuel Consumption²⁸

Thus, one issue to examine now in developing a new National Energy Security Strategy is whether to attempt to increase domestic crude oil supply for the transportation sector or rather should the government force increased conservation measures upon the public to decrease demand for oil.

Increasing US domestic oil production cannot fully meet our projected increase demand for oil. US domestic oil production which peaked in 1989 has now decreased to approximately 5.1 M bpd.²⁹ Increased use of oil extraction technologies such as thermal, water or CO₂ injection, commonly called second generation techniques, can extend the life of existing oil fields.³⁰ However, these techniques are expensive and the costs increase as the amount of oil in the reservoir declines. One of the major limitations of CO₂ injection is that low cost supplies are limited in the vicinity of our mature oil fields. Even though industry can and will use these techniques, US domestic production cannot make up the difference between supply and demand.

Tackling the problem directly means we have to address the largest consumer of oil which is motor vehicle transportation. The three primary methods of reducing oil consumption by the transportation sector would be to force conservation measures upon the American vehicle industry, increase incentives for production of alternative fuels (and the vehicles that consume them) such as ethanol, or mandate development of fuel cell vehicles that could use hydrogen as a fuel. Potentially, all three options could be pursued simultaneously.

Available technology exists that could be used to double the miles per gallon (mpg) of vehicles used in the US. These technologies include hybrid gasoline-electric cars (such as the Toyota Prius), Plug In Hybrids (Hybrid that could be plugged in at night to fully charge battery from wall outlet), and Flexible Fuel Vehicles (FFV) which are designed to burn alcohol, gasoline or any combination of the two.³¹ Some FFVs and hybrids already are used by the public although there is approximately a 10% price premium for the use of these vehicles. Increased FFV production would necessitate an increase in the production of ethanol or methanol. Ethanol (grain alcohol) is primarily generated in the United States from corn. Methanol is currently produced from natural gas. However, some of the clean coal pilot studies commissioned by the Department of Energy demonstrated that methanol can be produced from coal cost effectively.

Some environmentalists and conservationists believe that conservation alone should be used to reduce our oil consumption. Conservation alone could severely impact the economy and force drastic changes upon the American public. Any policy that would successfully address reducing our foreign oil dependence must include a combination of increasing the supply of transportation fuels (alternatives and oil) and

decreasing our consumption (increase fuel economy standards). Traditionally, Congress has mandated increasing the fuel economy standards through the use of the Corporate Average Fuel Economy (CAFÉ) standards. Recently, Congress in December 2007 mandated that the average fuel economy of American sedans and light trucks increase from 27.5 mpg to 35 mpg by 2020. Some proponents advocate an even sharper increase in fuel economy.

The country should deploy incremental changes to existing technologies and the country should pursue a new technological solution. The preceding paragraph outlined some of the incremental changes to existing technologies that could be deployed by American or foreign automakers. On the other hand, some of the innovators hope for a *new* technological solution or a means to innovate ourselves out of the problem, pinning their hopes on hydrogen cars. Hydrogen fuel cell cars seem to hold much promise since they would be zero emission and have great fuel economy. However, the two major drawbacks to hydrogen cars are fuel storage (reinforced stainless steel tank to withstand 10,000PSI) and the hydrogen production question. Currently hydrogen is mostly produced from crude oil or natural gas which brings us back to the original problem of attempting to decrease our foreign oil dependency. Biochemical methods of extracting hydrogen from seawater show promise, but clearly are still years away from fielding. Although we should not close off pursuit of fuel cell vehicles, mandating a more drastic increase in fuel economy standards could push us towards quickly manufacturing more FFV, hybrids or even FFV hybrids in the short term.

Another possible method to increase fuel economy would be to decrease or abandon emissions controls on vehicles. However, other than the obvious disadvantage

of more quickly polluting our air and decreasing overall air quality, there are other disadvantages to this policy. One of the most important is that some of our incremental changes to increase fuel economy standards have occurred due to research in meeting mandated emissions standards. With the exception of the introduction of the catalytic converter in the early 1970s, most of the improvements in decreasing emissions (nitrogen, sulfur and CO₂) have been achieved by improving the combustion efficiency of engines. Computer control chips, continuously variable transmission, smart engines that do not always use all of their cylinders have the effect of decreasing emissions as well as increasing fuel economy.

Any national energy strategy must also consider international implications and repercussions. For example, the United States signed the Kyoto Protocols in 1998, but never sent the Treaty to the Senate for ratification. The Kyoto Protocols mandated a reduction in the emission of greenhouse gases by the developed countries of the world. However, the Senate had two major objections to the Treaty. One, developing countries such as China and India did not have to undergo strict emissions controls like the United States or the European Union countries. Two, the majority of the US Senate resolved that they would not ratify a treaty that would have a negative economic effect upon the United States compared to other countries that did not have strict emissions guarantees (China and India). In President Bush's 2008 State of Union Address, he said the US must "complete an international agreement that has the potential to slow, stop, and eventually reverse the growth of greenhouse gases." US ratification of an international emissions agreement without a coherent and supporting National Energy Security Strategy could drastically affect the US economy.

The United States could increase its supply of foreign oil for the short and long term using the model developed by China. China has entered into treaties with various countries around the world to help them exploit their oil reserves to guarantee China's future access to oil from that country. This mercantilist approach may work in the mid to long term for the Chinese, but such an approach would continue to foster Chinese dependency on foreign oil. One major problem is that the Chinese economy will become more and more vulnerable to price spikes from foreign oil producers. Additionally, the Chinese will soon have to address their National Security issue of maintaining access to strategic resources. This will probably force the Chinese into increasing the size of their Navy to protect their economic interests. The United States could enter into similar agreements with some oil producing states, but this would simply continue having our economy sustained by foreign oil transfusions. Additionally, such agreements would force us to continue or even increase US military forward presence in the Persian Gulf or elsewhere.

Pillars of a National Energy Security Strategy

The primary pillar of a US National Energy Security Strategy should be a goal to be foreign oil "independent". Oil independence probably will not mean that the US cannot use or import any oil. However, the Honorable R James Woolsey argues that "if we want to end dependence on the whims of OPEC's despots, the substantial instabilities of the Middle East, and the indignity of paying for both sides in the War on Terror, we must define oil "independence" sensibly --- as doing whatever is necessary to avoid oil's being the instrument of despotic leverage and foreign chaos."³² Unfortunately, oil remains the key strategic "commodity" in the transportation sector

worldwide and our country's own strategic and foreign policy goals inextricably link us to the countries that export oil around the world. Because of oil's near monopoly as the fuel of choice, the United States currently has no choice in maintaining or severing the relationships with our oil producing partners.

Thus, the basis of a National Energy Security Strategy should be one primary objective, with four supporting and interconnected sub-objectives or lines of development. The primary objective to be clearly set out in a National Energy Security Strategy is that the United States must become foreign energy independent, with 2020 as the desired timeframe. Twelve years would span three Presidential Administrations and would allow sufficient time for the deployment of both near mature technologies and selected potentially innovative technologies. Those who might argue that twelve years is unrealistically short should note that twelve years is longer than either the Manhattan Project's duration or the time required to achieve President Kennedy's 1960's goal to put a man on the moon.

The four sub-objectives to be pursued in meeting the nation's main objective would be to diversify and increase energy supplies, increase conservation, decrease greenhouse gas emissions and modernize energy distribution and production systems. Establishing these pillars would require changes in law designed to influence the free market, as well as increases in money devoted to energy research and inducements for companies to construct new energy production facilities (oil, ethanol or methanol refineries) or carbon free power plants.

Diversifying and increasing US energy supplies can be accomplished through a variety of law changes and selected federal research investments. These proposals are

not all inclusive, but have the advantage of being readily implemented notwithstanding political considerations to be discussed later. The two proposals requiring changes in law are: granting access to the Arctic National Wildlife Refuge and selected promising offshore sites for exploration and drilling, and allowing the federal government to underwrite loans to companies willing to build alternative energy (non-nuclear) power plants. The three proposals probably not requiring legal changes, but requiring federal money are: funding federal government loan underwriting of new nuclear power plant construction as allowed in the 2007 Energy Bill; increasing federal investment in alternative energy sources (ex. cellulosic ethanol, hydrogen and coal liquification); and continuing investment in “clean coal” technology.

As noted earlier, decreasing greenhouse gas and emissions and increasing energy conservation are generally mutually supporting. They usually, however, do require changes in the law. Five proposals requiring Congressional action are: mandating a 50% increase in average mpg for all motor vehicles from the 2008 levels by 2020; institute a near zero emission law on all motor vehicles (similar to the standards on the Toyota Hybrid) by 2020; institute an additional 25% reduction in energy usage by home appliances by 2020; stimulate further energy efficiency research by mandating that all new power plants be carbon free after 2014 and that existing power plants retrofit to a carbon free status by 2020 or pay a carbon tax; and help broker and ratify a new Kyoto like treaty to decrease greenhouse gas emissions worldwide, thereby encouraging international technological innovations.

Modernizing energy distribution and production systems require one law change and two proposals requiring federal resources. One law change that will help increase

electrical supply over the long term would be to mandate that electrical utilities must reimburse and accept power into their lines from residential or commercial alternative energy sources. The two proposals requiring federal resources are increasing the connectivity between electric power grids and giving away or selling at low cost excess military or BLM properties for new refineries or carbon free power plants.

The table below highlights the links between the various proposals and sub-objectives further magnifying the need for a unifying, coherent National Energy Security Strategy.

Sub-Objective	Proposal	Supported by
Diversifying and Increasing US Energy Supplies	1. Granting access to the Artic National Wildlife Refuge and selected promising offshore sites for exploration and drilling	
Diversifying and Increasing US Energy Supplies	2. Allow federal government to underwrite loans to companies willing to build alternative energy (non-nuclear) power plants	10; Also, Federal Gov. should not give comp. edge to nuclear industry
Diversifying and Increasing US Energy Supplies	3. Funding new nuclear power plant construction loan underwriting as allowed in the 2007 Energy Bill	10
Diversifying and Increasing US Energy Supplies	4. Increasing federal investment in alternative energy sources (ex. cellulosic ethanol, hydrogen, coal liquification)	9 and 10
Diversifying and Increasing US Energy Supplies	5. Continued investment in "clean coal" technology	10 and 6;
Diversifying and Increasing US Energy Supplies	6. Increased federal investment in advanced oil extraction techniques.	5 and 10; possibly use fed. money for CO ₂ pipelines
Increasing conservation	7. Mandating a 50% increase in average mpg for all motor vehicles from the 2008 levels by 2020.	9
Increasing conservation	8. Institute another 25% reduction in energy usage by home appliances by 2020.	10; decrease in demand
Decreasing greenhouse gas emissions	9. Institute a near zero emission law on all motor vehicles similar to the Toyota Hybrid by 2020.	7

Decreasing greenhouse gas emissions	10. Mandate that all new power plants be carbon free after 2014 and that existing plants retrofit to a carbon free status by 2020 or pay a carbon tax.	5, 6 and 11; captured CO ₂ from carbon sequestering used to extract oil
Decreasing greenhouse gas emissions	11. Help broker and ratify a new emissions treaty to decrease greenhouse gas emissions worldwide.	
Modernizing energy dist. and production systems	12. Mandate that electrical utilities must pay for and accept power into their lines from residential or commercial alternative energy sources	10; increased power from res. sources will decrease demand
Modernizing energy dist. and production systems	13. Increasing the connectivity between electric power grids	
Modernizing energy dist. and production systems	14. Giving away or selling at low cost excess Military or Bureau of Land Management properties for new refineries or carbon free power plants	2 and 10

Table 2.

Analysis of Proposed National Energy Security Strategy Outline Using Strategy Formulation Model

Many global environmental forces could affect the US energy security strategy. First, oil exporting states tend to increase worldwide supply to gradually decrease the price of oil over the short term after an oil price shock. This market reaction tends to dissuade the oil importing countries from aggressively pursuing alternative energy research, development and deployment of viable alternatives to oil. Generally, this strategy has worked against the United States as evidenced by our vacillation in federal investment in alternative energy. A National Energy Security Strategy, with the goal of imposing strict conservation measures would help insulate the US from the expected reaction by oil exporting states. A positive global reaction to our National Energy Security Strategy would be international recognition that the US would assume

leadership in the fight to reduce greenhouse gas emissions and lessen the probability of drastic climate change.

Many domestic environmental forces would affect the implementation of a National Energy Security Strategy. A plethora of interest groups have various agendas that have blocked the federal government from acting strongly in the past to solve our energy insecurity. Conservation and environmental groups will generally oppose new oil drilling or construction of new nuclear power plants. The oil and gas industries as well as automobile manufacturers will oppose increased fuel efficiency and emission standards for motor vehicles. The difference would be the publication of a National Energy Security Strategy by the Executive Branch, acknowledgement by Congress of its validity as a strategy, and Congressional commitment of resources. However, the political acknowledgement that could accompany a National Energy Security Strategy could allow consensus building by our legislative leaders among the various interest groups.

The US Energy Security Strategy proposed above passes both the feasibility and suitability tests. The US has the means of successfully implementing this strategy of becoming energy independent in the next 12 years. The Department of Energy received \$21.2B in FY08.³³ Department of Defense budget in FY08 was \$670B with 74.7B allocated to Research, Development, Test and Evaluation and \$130B allocated to Procurement.³⁴ Assuming defense spending declines to approximately \$500B per year from 2010-2020, then a 1% diversion from the Department of Defense over 10 years would give the Department of Energy an additional \$50B for investment or loan underwriting. Making excess military or BLM properties available for power generation or fuel refining facilities would cost little or no federal resources. Additionally, the

creation of an Energy Security Trust Fund could be funded by the imposition of a gradually escalating carbon tax in lieu of implementing proposals seven through ten. The proposed National Energy Security Strategy framework will be suitable and it will achieve the desired ends after governmental energy experts modify and adjust it for final formulation.

The National Energy Security Strategy framework is acceptable as a strategy with two caveats. The overall National Energy Security Strategy objective of gaining energy independence would have broad domestic political and Congressional support. On the surface, the four proposed sub-objectives should have the same level of support as the primary objective. Strict emissions controls and increased conservation efforts could also promote a national ethic of stewardship.³⁵ However, interest groups would start to lobby against some of the proposals that run counter to the goals of that specific interest group. Some sort of compromise would have to be negotiated among the various groups so that a majority of Representatives and Senators could enact the required implementing mandates and legislation. Also, the Department of Energy and the Congressional Budget Office would have to determine the costs and benefits to the US economy that would accrue during the next decade after implementation of a fully resourced National Energy Security Strategy. On the flip side, the Department of Energy and the Government Accountability Office should be tasked with determining the costs of the US remaining foreign oil dependent. Accomplishing all this may be difficult, but should be achievable with strong strategic leadership.

Conclusion

The proposed National Energy Security Strategy reflects and enhances our national purpose and interests. The primary national purpose of the U.S. is the survival of the nation, and it is true that this may not be immediately jeopardized by failing to implement a National Energy Security Strategy. However, in the long term the nation is at risk from its foreign energy dependency. Furthermore, the National Security Strategy's secondary purpose of maintaining US economic and military preeminence in the world could be more immediately in jeopardy without an accompanying energy security strategy. Certainly, our national interest of promoting democracies worldwide is further enhanced by implementing a National Energy Security Strategy with the objective of energy independence by 2020. Thomas Friedman has defined petrolist states "as states that are dependent on oil production for the bulk of their exports or gross domestic products and have weak state institutions or outright authoritarian governments,"³⁶ and theorizes in the First Law of Petropolitics that "the price of oil and the pace of freedom always move in opposite directions in oil rich petrolist states."³⁷ A large percentage of US foreign oil imports come from states that are subject to Friedman's First Law of Petropolitics. Friedman concludes that "any American democracy strategy that does not also include a credible and sustainable strategy for finding alternatives to oil and bringing down the price of crude is utterly meaningless and doomed to fail."³⁸ Friedman is correct. Implementation of a National Energy Security Strategy, on the other hand, will enhance the American goal of promoting democratic movements around the world.

Many historians have called the 20th Century the American Century. In reality, the American Century probably began at the end of World War II. Since the end of the Cold

War, our free trade agreements and penchant for embracing free market ideals have greatly accelerated the growth of our economy as evidenced by our nation's GDP more than doubling in the past twenty years. Our military dominance is unquestioned across the globe. However, our continued dependence on foreign energy imports threatens our standing as the premier economic and military power. We have continued to invest in our military to ensure no one can threaten our position as the global military superpower. It is time to similarly invest in energy security so no one can threaten our economic supremacy. The process of developing and implementing a new National Energy Security Strategy can be the means to galvanize the national will to make that investment.

Endnotes

¹ The Southern States Energy Board, *American Energy Security: Building a Bridge to Energy Independence and To a Sustainable Future* (Norcross, GA: The Southern States Energy Board, July 2006), 13; available from <http://www.americanenergysecurity.org/AES%20Report.pdf>; Internet; accessed 7 November 2007.

² U.S. Government Accountability Office, *Crude Oil: Report to Congressional Requesters* (Washington, D.C.: U.S. Government Accountability Office, February 2007), 2.

³ George W. Bush, "State of the Union 2008," speech, U. S. Capitol, Washington, D.C., 28 January 2008; available from <http://www.whitehouse.gov/stateoftheunion/2008/index.html>; Internet; accessed on 31 January 2008.

⁴ Ernest R. May, *American Cold War Strategy: Interpreting NSC 68* (Boston, MA: Bedford Books of St. Martin Press, 1993), 17.

⁵ *Ibid.*, 71.

⁶ The Southern States Energy Board, 14.

⁷ Nader Elhefnawy, "Toward a Long Range Energy Security Policy," *Parameters* (Spring 2006): 102.

⁸ The Southern Energy States Board, 124.

⁹ Elhefnawy, 102.

¹⁰ “Mad Max” is a Mel Gibson movie set in an energy-starved post-apocalyptic Australia, where gangs roved the country in search of gasoline and other essential commodities.

¹¹ The Southern Energy States Board, 127.

¹² Ibid., 127.

¹³ GDP growth numbers derived from Historical Tables published by U.S. Office of Management and Budget, *Budget of the United States Government*, Fiscal Year 2009 (Washington, D.C.: U.S. Government Printing Office, 2008), 25; available from <http://www.whitehouse.gov/omb/budget/fy2009/pdf/hist.pdf>; Internet; accessed 31 January 2008.

¹⁴ George W. Bush, *The National Security Strategy of the United States of America* (Washington, D.C: The White House, March 2006), 27.

¹⁵ Ibid., 28.

¹⁶ Ibid., 29.

¹⁷ U.S. Department of Defense, *National Defense Strategy* (Washington, D.C.: U.S. Department of Defense, March 2005), 6.

¹⁸ U.S. Department of Defense, *National Military Strategy*, (Washington, D.C.: U.S. Department of Defense, 2004), 10.

¹⁹ American costs to defend flow of Persian Gulf oil in 2003 paraphrased from National Defense Council Foundation, *The Hidden Cost of Imported Oil*, (Washington, D.C.: National Defense Council Foundation, 30 October 2003); quoted in The Southern Energy States Board, 121.

²⁰ The price of oil has risen from \$30 a barrel in May 2001 to nearly \$110 a barrel at the time of publication of this work, see National Energy Policy Development Group, *National Energy Policy* (Washington, D.C.: U.S. Government Printing Office, May 2001), ch. 1, p 1-15.

²¹ The Southern Energy States Board, 123.

²² Thomas L. Friedman, “The Power of Green,” *The New York Times Magazine*, 15 April 2007; available from <http://nytimes.com/2007/04/15/magazine/15green.t.html>; Internet; accessed 8 November 2007.

²³ Ibid.

²⁴ Power generation data pulled from U.S. Energy Information Agency, “Electric Power Annual 2006”, 22 October 2007; available from <http://www.eia.doe.gov/cneaf/electricity/epa/epaxfiles1.xls>; Internet; accessed 18 December 2007.

²⁵ U.S. Department of Energy, “Nuclear Power Deployment Scorecard,” *Nuclear Power 2010*, 18 January 2008; available from http://www.ne.doe.gov/np2010/neScorecard_2008_01_18.html; Internet; accessed 8 February 2008.

²⁶ Elhefnawy, 103.

²⁷ U.S. Petroleum use graph derived from data at United States Energy Information Agency, "Liquid Fuels Supply and Distribution," March 2008; available at http://www.eia.doe.gov/oiaf/aeo/excel/aeotab_11.xls; Internet; accessed 22 March 2008.

²⁸ U.S. Transportation Sector table constructed from data at U.S. Energy Information Agency, "Liquid Fuels Supply and Distribution," March 2008; available from http://www.eia.doe.gov/oiaf/aeo/excel/aeotab_11.xls; Internet; accessed 22 March 2008.

²⁹ The Southern Energy States Board, 12.

³⁰ Ibid, 39.

³¹ The various types of vehicles described here are paraphrased from Set America Free Coalition, "Set America Free: A Blueprint for U.S. Energy Security," available from <http://www.setamericafree.org/blueprint.pdf>; Internet; accessed on 14 November 2007.

³² R. James Woolsey and Anne Korin, "Turning Oil into Salt," *National Review Online*, 25 September 2007; available from <http://article.nationalreview.com/?q=OTImMjFjYWVjOWI3ZGI0MzUxZDZjYTBIMmUzOTc2Mzc=>; Internet; accessed 16 December 2007.

³³ U.S. Office of Management and Budget, Budget of the United States Government, Fiscal Year 2009 (Washington, D.C.: U.S. Government Printing Office, 2008), 79; available from <http://www.whitehouse.gov/omb/budget/fy2009/pdf/hist.pdf>; Internet; accessed on 31 January 2008.

³⁴ Ibid, 61.

³⁵ Idea of the ethic of stewardship in relation to energy security is paraphrased from Friedman, "Power of Green."

³⁶ Thomas L. Friedman, "First Law of Petropolitics," *Foreign Policy* (May/June 2006): 31.

³⁷ Ibid.

³⁸ Ibid., 36.